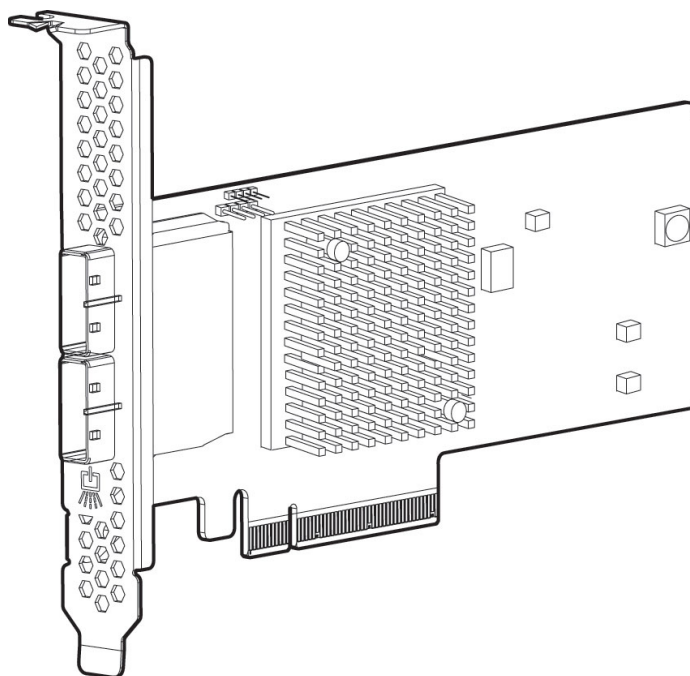


Overview

The HP H221 Host Bus Adapter is a 2X4 external ports HBA provides customers with the flexibility and speed they have come to expect from HP. The H221 HBA has been optimized for connection to the SAS based HP P2000 G3 SAS Modular Smart Array and provides support for both 6 Gb SAS and SATA Hard Disk Drives. In addition, H221 HBA controller provides support for SAS tape drives. This SAS HBA is ideal for driving cost-effective and reliable scalability in today's data centers.



Model

Host Bus Adapter	HP H221 Host Bus Adapter	650931-B21
------------------	--------------------------	------------

Kit contents

- HP H221 Host Bus Adapter
- Low profile controller bracket

Compatibility

Servers

ProLiant DL (rack-optimized):

- HP ProLiant DL360p Gen8
- HP ProLiant DL380p Gen8

ProLiant ML (expansion-optimized):

- HP ProLiant ML350p Gen8

NOTE: This is a list of supported servers. Some may be discontinued.



Standard Features

Performance	Designed to be as flexible as HP servers, HP H221 Host Bus Adapter provides support for the HP P2000 G3 SAS Modular Smart Array. The HP adapter delivers exceptional system performance, with eight 6 Gb/s SAS ports providing up to 48 Gb/s total storage bandwidth.
HP Server Integration	Fully integrated and tested with ProLiant servers and management software.
Key Features	• SAS technology delivers high performance and data bandwidth up to 6 Gb/s per physical link • Mix-and-match SAS and SATA hard drives; deploy drive technology as needed • PCIe x8 (4 GB/s bandwidth) • PCIe 2.0 x8 capable
Ports	Eight (8) SAS physical links distributed across 2 x4 external SFF8088 Mini-SAS connectors
Performance	HP's High Performance Architecture sets new boundaries for industry performance expectations! • 6 Gb/s SAS (bandwidth per physical link) • 48 Gbps total available bandwidth (8 physical links x 6Gbps) • PCIe 2.0 host interface x8 (5 GT/s bandwidth)
Capacity	Fulfilling the need for high performance and capacity expansion, the HP H221 SAS HBA offers: • Eight 6 Gbps SAS physical links supporting up to 2 simultaneous x4 Wide SAS Ports • Capacity up to 288 TB of SAS or 192 TB SATA
Form Factor	• Either high-profile or low-profile PCIe 2.0 slots. (parts included with option)
Supported Enclosures	• HP P2000 G3 SAS MSA Dual Controller LFF Array System (Two AW592A G3 SAS controllers, one AP838A LFF 12-drive bay chassis) • HP P2000 G3 SAS Modular Smart Array Controller



Standard Features

Operating Systems

Microsoft Windows 2003 Standard 32 Bit
Microsoft Windows 2003 Enterprise 32 Bit
Microsoft Windows 2003 Standard x64
Microsoft Windows 2003 Enterprise x64
Microsoft Windows Server 2008
Microsoft Windows Server 2008 R2
Red Hat Enterprise Linux 5
Red Hat Enterprise Linux 6
SUSE Linux Enterprise Server 10
SUSE Linux Enterprise Server 11
VMware ESX (32/64) 4.0

NOTE: For more Linux OS support & certification information, please visit our the ProLiant & BladeSystem Server Linux matrix: <http://h18004.www1.hp.com/products/servers/linux/hplinuxcert.html>

Off Line

HP Smart Component for HP H221 Host Bus Adapter

Warranty

The warranty for this device is 1 year parts only.

Warranty Upgrade Options

- Response - Upgrade on-site response from next business day to same day 4 hours
- Coverage - Extend hours of coverage from 9 hours x 5 days to 24 hours x 7 days
- Duration - Select duration of coverage for a period of 1, 3, or 5 years
- Warranty upgrade options can come in the form of Care Packs, which are sold at the HP System level this product attaches too



Service and Support

Service and Support

HP Technology Services

HP Technology Services offers you consultants and support experts to solve your most complex infrastructure problems. We help keep your business running, boost availability, and avoid downtime.

Protect your business beyond warranty with HP Care Pack Services

When you buy HP Options, it's also a good time to think about what level of service you may need. HP Care Pack services provide total care and support expertise with committed response choices designed to meet your IT and business need.

HP Foundation Care services deliver scalable support-packages for HP industry-standard servers and software. You can choose the type and level of service that is most suitable for your business needs. New to this portfolio is HP Collaborative Support. If you are running business critical environments, HP offers Proactive Care or Critical Advantage. These services help you deliver high levels of application availability through proactive service management and advanced technical response.

Here is the support service recommendation from the Foundation Care and Proactive Care portfolio. For customized support service solution, HP can work with you to tailor a service solution for your unique support requirements using broader services portfolio of Foundation Care and Proactive Care.

Recommended HP Care Pack Services for optimal satisfaction with your HP product

Recommended Services 3-Year HP 24x7 4 hour Response, Hardware Support Onsite Service

Provides you with rapid remote support and if required an HP authorized representative who will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5982-6547EEE.pdf>

OR

3-Year HP 24x7 4 hour Response, HP Collaborative Support

Offers customers a single point of contact for server problem diagnosis, hardware problem resolution, and basic software problem diagnosis, fault isolation, and resolution if available to HP. If the problem is with HP HW, the representative will arrive on site any time and day of the year to begin hardware maintenance service within 4 hours of the service request being logged. In case, the issue is with HP or supported third-party software product and cannot be resolved by applying known fixes, HP will contact the third-party vendor and create a problem incident on your behalf.

HP ProLiant Server Hardware Installation

Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner

<http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf>



Service and Support

Related HP Care Pack Services to enhance your HP product experience

Related Services

3-Year HP 24x7 4 hour Response, Proactive Care or Critical Advantage

Helps optimize your systems and delivers high levels of application availability through proactive service management and advanced technical response. A skilled Technical Manager will own your query or issue end to end until resolved, delivering a single point of contact for you

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-2140ENW.pdf>

OR

3-Year HP 6-hour Onsite Call-to-Repair, HP Collaborative Support

Offers customers a single point of contact for server problem diagnosis, hardware problem resolution to return the hardware in operating condition within 6 hours of the initial service request to the HP Global Solution Center, and basic software problem diagnosis, fault isolation, and resolution if available to HP. In case, the issue is with HP or supported third-party software product and cannot be resolved by applying known fixes, HP will contact the third-party vendor and create a problem incident on your behalf.

HP Proactive Select Service

Provides a flexible way to purchase HP best-in-class consultancy and technical services. You can buy Proactive Select Service Credits when you purchase your hardware and then use the credits over the next 12 months.

<http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA2-3842ENN.pdf>

Insight Remote Support

Provides 24 X 7 remote monitoring, proactive notifications, and problem resolution. Learn more

<http://www.hp.com/go/insightremotesupport>

HP Support Center

Personalized online support portal with access to information, tools and experts to support HP business products. Submit support cases online, chat with HP experts, access support resources or collaborate with peers. Learn more <http://www.hp.com/go/hpsc>

HP's Support Center Mobile App* allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalized IT support anywhere, anytime.

HP Insight Remote Support and HP Support Center are available at no additional cost with a HP warranty, HP Care Pack or HP contractual support agreement.

*HPⁱ Support Center Mobile App is subject to local availability



Service and Support

Parts and materials

HP will provide HP-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements. Supplies and consumable parts will not be provided as part of this service; standard warranty terms and conditions apply. Parts and components that have exceeded their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual or the technical product data sheet will not be provided, repaired or replaced as part of this service.

Warranty / Service Coverage

For ProLiant servers and storage systems, this service covers HP-branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as external monitors up to 22" and tower UPS products; these items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been exceeded. Coverage of the UPS battery is not included; standard warranty terms and conditions apply.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HP due to malfunction. It does not apply to any exchange of Disk or SSD/Flash Drives that have not failed. SSD/Flash Drives that are specified by HP as consumable parts and/or that have exceeded maximum supported lifetime and/or the maximum usage limit as set forth in the manufacturer's operating manual or the technical data sheet are not eligible for the defective media retention service feature option.

For more information

To learn more on services for HP ESSN Options, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: <http://www.hp.com/services/proliant> or www.hp.com/services/bladesystem



Related Options

NOTE: This is a list of supported options. Some may be discontinued.

HP Disk Storage Systems	HP P2000 G3 Modular Smart Array Systems	
	P2000 G3 SAS Controller	
	HP P2000 G3 SAS MSA Array System Controller	AW592A
	P2000 Controller-less Chassis (AC-powered)	
	HP P2000 LFF Modular Smart Array Chassis	AP838A
	HP P2000 SFF Modular Smart Array Chassis	AP839A
	Configured Units, 6 Gb SAS Systems	
	HP P2000 G3 SAS MSA Dual Controller LFF Array System	AW593A
	HP P2000 G3 SAS MSA Dual Controller SFF Array System	AW594A
	NOTE: Please see the QuickSpecs for additional part numbers and information at: http://h18000.www1.hp.com/products/quickspecs/13551_na/13551_na.html	

HP Tape Drives	DAT Tape Drives	
	HP DAT 160 SAS Internal Tape Drive	Q1587A
	HP DAT 160 SAS External Tape Drive	Q1588A
	HP DAT 320 SAS Internal Tape Drive	AJ830A
	HP DAT 320 SAS External Tape Drive	AJ828A
	LTO Ultrium Tape Drives	
	HP Ultrium 448 SAS Internal Drive	DW085A
	HP Ultrium 448 SAS External Drive	AP839A
	HP Ultrium 920 SAS Internal Tape Drive	EH847A
	HP Ultrium 920 SAS External Tape Drive	EH848A
	HP LTO-4 Ultrium 1760 SAS Internal WW Tape Drive	EH919A
	HP LTO-4 Ultrium 1760 SAS External Tape Drive	EH920A
	HP LTO-4 Ultrium 1760 SAS (1) in 1U Rack-mount Kit	EH946A
	HP LTO-4 Ultrium 1840 SAS Internal Tape Drive	EH860A
	HP LTO-4 Ultrium 1840 SAS External WW Drive	EH861A
	HP LTO-5 Ultrium 3000 SAS Internal Tape Drive	EH957A
	HP LTO-5 Ultrium 3000 SAS External Tape Drive	EH958A
	HP LTO-5 Ultrium 3280 SAS Internal Tape Drive	EH899A
	HP LTO-5 Ultrium 3280 SAS External Tape Drive	EH900A
	Rack-mount Tape Drive Enclosures	
	HP 1U SAS Rack-mount Kit	AE459A
	NOTE: The 1U SAS Rack-Mount Kit can support up to (2) half-height tape drives and is compatible with the DAT 160 SAS, LTO-2 Ultrium 448 SAS, LTO-3 Ultrium 920 SAS and LTO-4 Ultrium 1760 SAS tape drives.	
	HP 3U SAS Rack-mount Kit	AG576A
	NOTE: The 3U Rack-mount Kit can support up to (2) full-height or (4) half-height tape drives and compatible with multiple SAS tape drives including DAT 160 SAS, LTO-2 Ultrium 448 SAS, LTO-3 Ultrium 920 SAS, LTO-4 Ultrium 1760 SAS and LTO-4 Ultrium 1840 SAS tape drives.	
	Tape Autoloaders	
	HP 1/8 G2 LTO-4 Ultrium 1760 SAS Tape Autoloader	AK377A
	HP 1/8 G2 Ultrium 920 SAS Autoloader	AH558A



Related Options

HP 1/8 G2 LTO-5 Ultrium 3000 SAS Tape Autoloader	BL536A
Tape Libraries	
HP MSL2024 1 LTO-4 Ultrium 1760 SAS Tape Library	AK378A
HP MSL2024 Ultrium 920 SAS Tape Library	AH559A
HP MSL2024 1 LTO-5 Ultrium 3000 SAS Tape Library	BL537A
HP MSL4048 2 LTO-4 Ultrium 1760 SAS Tape Library	AK380A
HP MSL4048 2 LTO-5 Ultrium 3000 SAS Tape Library	BL538A
HP MSL8096 2 LTO-4 Ultrium 1760 SAS Tape Library	AK382A
HP MSL8096 2 LTO-5 Ultrium 3000 SAS Tape Library	BL539A
SAS Cables for Tape Drives and Automation	
HP Mini-SAS Cable for LTO Internal Tape Drive	AP746A
NOTE: Use this cable to connect HP Ultrium 448, 920, 960, 1760 and 1840 SAS internal tape drives to Mini-SAS (SFF8087) ports. This replaces the existing cable connecting the HBA/controller to the disk backplane. This replacement cable has three channels for disks and 1 channel for the tape drive (SFF8482 port).	
HP SAS Min-Min 1x-2M Cable Assembly Kit	AE470A
NOTE: Use this cable to connect HP SAS external tape devices to HP SAS controllers with external Mini-SAS (SFF8088) connectors.	
HP SAS MIN-MIN 1X-4M Cable Assembly Kit	AE465A
NOTE: Use this cable to connect HP SAS external tape devices to HP SAS controllers with external Mini-SAS (SFF8088) connectors.	
HP SAS MIN-MIN 3X1X-5M Cable Assembly Kit	AG452A
NOTE: This split cable connects internally to SAS Hard Drive Cage (3 channels) and externally to the tape drive (1 channel) with other connector attaching to the controller. The external cable, for the drive, requires a PCI slot to exit the server.	
HP 2m External Mini-SAS to 4x1 Mini-SAS Cable	AN975A
NOTE: One cable is required for every four drives. Use this cable to connect HP MSL SAS Tape Libraries to Mini-SAS (SFF8088) ports.	
HP 4m External Mini-SAS to 4x1 Mini-SAS Cable	AN976A
NOTE: One cable is required for every four drives. Use this cable to connect HP MSL SAS Tape Libraries to Mini-SAS (SFF8088) ports.	



Technical Specifications

Dimensions (excluding bracket)	6.6 x 2.7 x 0.6 in (16.8 x 6.86 x 1.6 cm)
Disk Drive and Enclosure Protocol Support	6 Gbps SAS (Serial Attached SCSI) 3 Gbps SATA (Serial Advanced Technology Attachment)
Architecture	Serial Attached SCSI (SAS) Serial Advanced Technology Attachment (SATA) PCIe 2.0 x8
SAS Connectors	2x4 external SFF-8088 (Mini-SAS)
Data Transfer Method	600 MB/s bandwidth (1200 MB/s, full duplex) per port for combined throughput of up to 48 Gb/s
PCIe Bus Speed	PCIe 2.0 x8 (5 GT/s maximum bandwidth)
Simultaneous Connection Transfer Ports	2 x 4 Wide SAS Connectors
Port Transfer Rate	24 Gb/s per x4 Wide SAS Port (4 x 6 Gb/s)
Software upgradeable Firmware	Yes
Maximum Capacity	288 TB SAS, 192 TB SATA
Memory Addressing	64-bit, supporting servers memory greater than 4 GB
Upgradeable Firmware	4-MB flashable ROM
Disk Drive and Enclosure Protocol Support	6 Gb/s SAS / 3 SATA

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.
--	--------------------------------------	--

© Copyright 2012 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice. Microsoft and Windows are registered trademarks or trademarks of Microsoft Corporation in the U.S. and/or other countries. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

For hard drives, 1 GB = 1 billion bytes. Actual formatted capacity is less.

